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OPERATIONS AND MAINTENANCE PROGRAM

For

BRIDGEWATER STATE UNIVERSITY
Bridgewater, Massachusetts

Prepared for:

BRIDGEWATER STATE UNIVERSITY
131 Summer Street
Bridgewater, MA 02324

Prepared by:

NITSCH ENGINEERING, INC.
2 Center Plaza, Suite 430
Boston, MA 02108

Nitsch Project #11917.2

Bridgewater State University[1] (BSU) has formalized its Operations and Maintenance (O&M) activities into this written O&M Program as required in Part 2.3.7 of the United States Environmental Protection Agency's (EPA) 2016 National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts, hereafter referred to as the "2016 Small MS4 Permit" or "the Permit."

This O&M Program has a goal of preventing or reducing pollutant runoff and protecting water quality from all BSU operations. The O&M Program includes the following components:

1. Inventory of BSU facilities within the categories of parks and open space, buildings and facilities (where pollutants are exposed to stormwater runoff), and vehicles and equipment with procedures described for each maintenance activity identified;
2. Operations and maintenance procedures for BSU infrastructure; and
3. Stormwater Pollution Prevention Plan (SWPPP) for BSU facilities where pollutants are exposed to stormwater.

This written document also supplements the BSU Facilities Management and Planning Department *Policies and Procedures Manual*, last revised in November 2016. The *Policies and Procedures Manual* should be referenced for details around staffing practices, scheduling of tasks, and parties responsible for delegating and oversight of work assignments.

BSU has identified Environmental Health and Safety (EH&S) as the primary lead responsible for implementing the O&M Program. Facilities Management is largely responsible for maintaining BSU facilities adhering to the procedures described herein.

1.0 Inventory of BSU Facilities

BSU has developed this inventory of BSU facilities within the categories of parks and open space, buildings, and facilities where pollutants are exposed to stormwater runoff, and vehicles and equipment as required in Part 2.3.7.a.ii of the Permit. Within each category, maintenance activities are identified for each listed facility. The procedures outlined for each maintenance activity follow in the subsequent sections.

[1] As a University owned and operated by the Commonwealth of Massachusetts, Bridgewater State University is considered a non-traditional MS4. The requirements for non-traditional MS4s vary slightly from municipal MS4s as outlined in Section 5.0 of the 2016 Small MS4 permit. This Operations and Maintenance Program was developed to align with the intent of the Permit for non-traditional MS4s.

1.1 Parks and Open Space

The following BSU facilities are included in the inventory for parks and open space:

Park/Open Space	Address/Location	Lawn Mowing	Landscaping	Fertilizing	Pesticide/Herbi	Trash mgmt.	Pet waste	Waterfowl	Other Maintenance
Swenson Athletic Complex, Alumni Park, Athletic Fields	Tinsley Drive	X	X	X	X	X	X	X	Repainting athletic fields
University Park		x	x	x	x	x	x		
Great Hill Trails	Entrances at Tinsley Center (325 Plymouth St.) and Operations Center (200 Great Hill Drive)						x		Not maintained by BSU, except pet waste stations
General landscaping	Throughout campus	x	x	x	x	x	x		

BSU discharges into the South Brook and Town River, which are tributary to the Taunton River and eventually flow into Mount Hope Bay. The lower segments of the Taunton River are impaired for Fecal Coliform and Mount Hope Bay is impaired for Fecal Coliform and Total Nitrogen (according to the Massachusetts Year 2016 Integrated list of Waters). Under MS4 Permit requirements, BSU is subject to additional requirements to address nitrogen in their stormwater discharges. Many of these are already standard practices that are followed by BSU. Although managing pet waste is the responsibility of pet owners, BSU encourages the removal of pet waste from campus grounds to reduce fecal coliform in stormwater discharges with the use of pet waste stations installed around campus.

1.1.1 General

- Repair damage to landscaped or mulch or vegetated bare areas as soon as possible to prevent erosion. If there are areas of erosion or poor vegetation, repair them as soon as possible, especially if they are within 50 feet of a surface water (e.g., pond, lake, or river).
- Remove (sweep or shovel) materials such as soil, mulch, and grass clippings from parking lots, streets, curbs, gutters, sidewalks, and drainage-ways.
- Do not clean up any unidentified or possibly hazardous materials found during maintenance; notify a supervisor immediately.

1.1.2 Lawn Mowing

- Remove debris, pet waste and trash from landscaped areas prior to mowing.
- Collect grass clippings and leaves after mowing. Blowing organic waste materials onto adjacent impervious surfaces or washing them into the street, gutter, or storm drains is strictly prohibited.
- Properly recycle or dispose of organic waste after mowing, weeding, and trimming.
- Reduce mowing frequencies wherever possible by establishing low/no-mow areas in lesser-used spaces.
- Brush off mowers (reels and decks) and tractors over grassy areas or in contained washout areas. Do not hose off mowers over paved areas that drain into the MS4 or directly to surface waters.
- Follow proper vehicle and equipment maintenance procedures to prevent leaks (see section 1.3)
- Do not allow grease from mowers to fall onto areas where they can be washed into the stormwater system.

1.1.3 Landscaping

- Remove debris, pet waste, and trash from landscaped areas.
- Collect leaves, weeds, and trimmings after landscaping activities. Blowing organic waste materials onto adjacent impervious surfaces or washing them into the street, gutter, or storm drains is strictly prohibited.
- Properly recycle or dispose of organic waste after weeding, trimming, and raking.
- Follow proper fueling procedures for all equipment to ensure that petroleum products do not enter the stormwater system (see section 4.2 of the SWPPP).
- Fertilizers, herbicides, and pesticides should be properly used, stored, and handled (see section 1.1.3, section 1.1.4 and section 4.4.2 of the SWPPP).

1.1.4 Fertilizing

- All fertilizer products must be registered with the Department of Agricultural Resources.
- Fertilizers should only be applied by properly trained personnel.
- Perform soil testing before choosing a fertilizer. The quantity of available nutrients already present in the soil will determine the type and amount of fertilizer that is recommended. The soil test will also determine the soil pH, humic matter, texture, and exchangeable acidity, which will indicate whether pH adjustment is required for fertilizer to work efficiently. A soil test should be completed at each facility, as soil type can vary widely across campus.
- Soil tests are recommended every three to four (3 to 4) years for turf and plantings (more frequently for problem or newly planted areas) and every year for soil where phosphorus-containing fertilizers are used. Soil pH tests should be conducted every year for all sites.
- When collecting soil samples, take multiple samples for each target area at a 4-inch depth; mix the samples together in a container and properly label the sample with property information and site use type. Separately sample areas that have discoloration, abnormal plant growth, or other problems. Take the sample at approximately the same time every year. If the area has been fertilized, wait eight (8) weeks after fertilizing to test the soil to ensure nutrients have been absorbed.

- When selecting the optimal type of fertilizer to use on an area, consider the soil test results, type of turf, and type of turf use. In accordance with nitrogen impaired receiving water requirements, use slow-release fertilizers and reduce fertilizer use where possible.
- Calibrate application equipment regularly to ensure proper application and loading rates.
- Mix fertilizers using clean application equipment under cover in an area where accidental spills will not enter surface water or groundwater and will not contaminate the soil.
- Never apply fertilizers in quantities exceeding the manufacturer's instructions. Instead, apply small amounts throughout the growing season.
- Time fertilizer application methods for maximum plant uptake, usually in the fall and spring (e.g., between April 15 and October 15). When applying at the beginning and end of planting season, take into consideration the slower uptake rate of fertilizer by plants and adjust the fertilizer application accordingly.
- Never apply fertilizer during a drought, when the soil is dry or frozen, when it is raining, or immediately before expected rain.
- Fertilizer should be applied when the ground temperature is above 55° F.
- Apply fertilizers in amounts appropriate for the type of vegetation to minimize losses to surface water and groundwater. Use the results of the soil test to determine optimal fertilizer timing and application rates.
- Where applicable, till fertilizers into the soil rather than dumping or broadcasting (proper application techniques will depend on the type of soil and vegetation).
- Do not hose down paved areas after fertilizer application if drainage will enter into an engineered storm drain system or drainage ditch.
- Limit irrigation after fertilizer application to prevent runoff (approximately ½ inch of water per application for a week following application).
- Turn off irrigation systems during periods of adequate rainfall.
- Do not over-apply fertilizer in late fall to "use it up" before winter. The effectiveness of fertilizer does not reduce when stored.
- If phosphorus fertilizer is used when re-seeding, mix the phosphorus into the root zone. Do not apply directly to the soil surface.
- Avoid combined products such as "weed and feed," which do not target specific problems at the appropriate time.

1.1.5 Pesticide/Herbicide

- All pesticide products must be registered by the Massachusetts Pesticide Board Subcommittee.
- Pesticides should only be applied by licensed or certified applicators.
- Calibrate application equipment regularly to ensure proper application and loading rates.
- Ensure that pesticide application equipment is capable of immediate shutoff in case of emergency.
- Conduct spray applications according to specific label directions and applicable local regulations.
- Never apply pesticides in quantities exceeding the manufacturer's instructions.
- Apply pesticides at the life stage when the pest is most vulnerable.
- Never apply pesticides if it is raining or immediately before expected rain.
- Establish setback distances from pavement, storm drains, and waterbodies, which act as buffers from pesticide application, with disease-resistant plants and minimal mowing.

- Do not apply pesticides within 100 feet of open waters or of drainage channels.
- Spot treat infected areas instead of the entire location.
- Mix pesticides and clean application equipment under cover in an area where accidental spills will not enter surface water or groundwater and will not contaminate soil.
- Do not hose down paved areas after pesticide application to a storm drain or drainage ditch.
- Recycle rinsate from equipment cleaning back into product.
- Choose the least toxic pesticide that is still capable of reducing the infestation to acceptable levels.
- Use alternatives to pesticides, such as manual weed control, biological controls, and Integrated Pest Management strategies
- For the use of herbicides, reduce seed release of weeds by timing cutting and pesticide application at seed set.

1.1.6 Trash Management

- All waste and recycling containers must be leak-tight with tight-fitting lids or covers.
- Place waste and recycling containers indoors or under a roof or overhang whenever possible.
- Clean and sweep up around outdoor waste containers regularly.
- Arrange for waste and recyclables to be picked up regularly and disposed of at approved disposal facilities.
- Do not wash out waste or recycling containers outdoors or in a parking lot.
- Conduct periodic inspections of waste areas to check for leaks and spills.
- Ensure there are enough trash and recycling containers at appropriate areas.
- Monitor waste and recycling containers at heavily used sites and during campus events to ensure that there is no overflow.

1.1.7 Pet Waste Management

- Provide pet waste stations with bags and trash receptacles where pets are permitted. Post signs describing the proper disposal of pet waste.
- Refill pet waste stations when bags are low in quantity.

1.1.8 Waterfowl Management

- Identify undesirable waterfowl congregation areas and take steps to prevent waterfowl droppings from entering the stormwater system or surrounding waterbodies.
- Take measures to discourage congregation near waterbodies and the storm system (e.g., use strobe lights or reflective tape, establish no-mow zones to reduce available feeding areas, or plant thick vegetation along waterlines). If waterfowl congregation cannot be managed, then isolate the drainage from congregation areas away from the storm system and waterbodies.
- Conduct periodic inspections to check the measures are working as intended and to replace or repair measures as needed.
- Install signage to educate the public on the negative effects of waterfowl feces entering the stormwater system or nearby waterbodies in order to discourage public feeding.

1.1.9 Other Maintenance Activities

- Conduct periodic inspections of the irrigation system. Repair broken sprinkler heads as soon as possible. Only irrigate at a rate that can infiltrate into the soil to limit runoff. Avoid irrigating close to impervious surfaces such as parking lots and sidewalks.
- See section 2.3 for Winter Road Maintenance for information on proper snow disposal and storage procedures. Any damage done to vegetated areas caused by plows or deicing materials should be repaired as early as possible in the spring.
- All portable toilets should be staked down in flat, secure locations where they are less likely to be knocked down or blown over. They should be placed in a location that would retain any spillage from washing into the MS4 or receiving waters. Ensure routine maintenance and cleaning of portable toilets.
- Wastewater from power washing signs, structures, or bleachers cannot be discharged into the stormwater system.
- When painting park equipment, use a drop cloth and clean up any spills immediately.
- Do not leave open containers on the ground where they may accidentally tip over.

1.2 Buildings and Facilities

The following BSU facilities are included in the inventory for buildings and facilities where pollutants are exposed to stormwater runoff:

Building/Facility	Address/Location	Petroleum	Dumpsters	Building	Parking lots	Spill Prevention	Other maintenance:
Operations Center	200 Great Hill Drive	x	x	x	x	x	
"Tree Farm" (Staging Area/ Maintenance Yard)	400 Summer Street		x	x		X	
Greenhouse and Stearns/McNamara Memorial Garden	16 Park Ave.		x	X		X	
Central Steam Plant	34 Park Ave. Rear	x	x	X	x	X	
Blockhouse at Swenson Athletic Complex	Tinsley Drive		x	X		X	
Kelly Gymnasium (pool)	34 Park Ave.		x	X		X	
Surface parking lots	Throughout campus		x	X		X	
Academic Buildings	Throughout campus		x	X		X	
Dining Halls	Throughout campus		x	X		X	
Residential Buildings	Throughout campus		x	X		X	
Administrative Buildings	Throughout campus		x	x		x	

* Refer to the Spill Prevention Control and Countermeaure (SPCC) Plan dated November 2007 prepared by TRC Environmental Corporation for comprehensive information on the storage of oils and fuels at BSU, including the locations of underground storage tanks, aboveground storage tanks, oil-filled electrical transformers, drum storage areas, and hydraulic elevators with oil reservoirs around campus.

1.2.1 Petroleum Products and Potential Pollutants

- Floor drains in storage areas should be disconnected from the stormwater system
- Routinely inspect buildings and facilities for areas of potential leaks.
- For storage and handling procedures of petroleum products and potential pollutants, refer to section 4.4.3 of the SWPPP.
- For storage and handling procedures for fertilizers, pesticides, and herbicides, refer to section 4.4.2 of the SWPPP.
- All buildings and facilities should be periodically inspected to address potential pollutant sources (e.g., leaks).

1.2.2 Dumpsters

All liquid and solid waste must be disposed of properly. Some of the most common sources of pollution at facilities are a result of littering, improper collection of debris, and improper disposal of solid or liquid waste.

- All waste and recycling receptacles must be leak-tight with tight-fitting lids or covers.
- Keep lids on dumpsters and containers closed at all times unless adding or removing material. If using an open-top roll-off dumpster, cover it and tie it down with a tarp unless adding materials.
- Place waste or recycling receptacles indoors or under a roof or overhang whenever possible.
- Locate dumpsters on a flat, paved surface and install berms or curbs around the storage area to prevent run-on and run-off.
- Do not locate dumpsters over or adjacent to catch basins.
- Prior to transporting waste, trash, or recycling, ensure that containers are not leaking (double bag if needed) and properly secure containers to the vehicle.
- Clean up any liquid leaks or spills with dry cleanup methods.
- Arrange for waste or recycling to be picked up regularly and disposed of at approved disposal facilities.
- Never place hazardous materials, liquids, or liquid-containing wastes in a dumpster or recycling or trash container (see section 4.4.4 of the SWPPP).
- Do not wash trash or recycling containers outdoors or in parking lots.
- Conduct periodic inspections of solid and liquid waste storage areas to check for leaks and spills.
- Conduct periodic inspections of work areas to ensure that all wastes are being disposed of properly.
- In dumpster areas, regularly pick up surrounding trash and debris and regularly sweep the area.
- In compactor areas, regularly check the hydraulic fluid hoses and reservoir to ensure that there are no cracks or leaks. Regularly sweep the area.

1.2.3 Building Maintenance

- When power washing buildings and facilities, ensure that the washwater does not flow into the storm system. Containment or filtering systems should be provided.
- Paint and other chemicals should not be applied on the outside of buildings when it is raining or prior to expected rain.
- When sanding, painting, power washing, etc., ensure that sites are properly prepared (e.g., use tarps) and cleaned (e.g., use dry cleaning methods) especially if they are near storm drains. Protect catch basins when maintenance work is conducted upgradient of them.
- When painting, use a drop cloth and clean up any spills immediately.
- Do not leave open containers on the ground where they may accidentally tip over.
- Buildings should be routinely inspected for areas of potential leaks.
- Do not discharge chlorinated pool water into the stormwater system. Water must be properly dechlorinated and tested before it is discharged.

1.2.4 Parking Lots

- Streets and parking lots surrounding municipal buildings and facilities should be swept and kept clean to reduce runoff of pollutants and debris to the stormwater system.
- Streets and parking lots around buildings and facilities will be swept in accordance with the procedures in section 2.2.

1.2.5 Spill Prevention Plan

- Refer to the Spill Prevention Control and Countermeasure (SPCC) Plan dated November 2007 prepared by TRC Environmental Corporation (see Appendix) that is currently in place for BSU. Coordinate with the Bridgewater Fire Department as necessary.
- Spill Prevention and Response for chemical and hazardous spills is outlined in section 4.1 of the SWPPP.

1.2.6 Vehicles and Equipment

The following BSU facilities are included in the inventory for vehicles and equipment:

Vehicles/Equipment	Address/Location	Vehicle	Vehicle maint.	Body	Fueling areas	Material mgmt.	Parts Cleaning	Vehicle	Other maintenance:
Operations Center	200 Great Hill Drive	x	x	x	x	x	x	X	
Parking Garage	Great Hill Drive	X							
Central Steam Plant	34 Park Ave. Rear	x							

1.3.1 Vehicle Storage

- Monitor vehicles and equipment for leaks and use drip pans as needed until repairs can be performed.
- When drip pans are used, avoid overtopping.
- Drain fluids from leaking or wrecked vehicles and parts as soon as possible. Dispose of fluids properly.
- Store and park vehicles on impervious surfaces and/or under cover or indoors whenever possible.

1.3.2 Vehicle Maintenance

- Conduct routine inspections of heavy equipment and vehicles to proactively identify maintenance needs or potential leaks.
- Perform routine preventive maintenance to ensure heavy equipment and vehicles are operating optimally.
- Recycle or dispose of waste properly and promptly.
- Sweep and pick up trash and debris as needed.

1.3.3 Body Repair and Painting

- Conduct all body repair and painting work indoors.
- Minimize waste from paints and thinners. Calculate paint needs based on surface area.
- Use dry cleanup methods (vacuum, sweep) to clean up metal filings and dust and paint chips from grinding, shaving, and sanding. Sweep debris from wet sanding after allowing it to dry overnight on the shop floor. Dispose of waste properly; never dump waste into storm or sanitary sewers.
- Use sanding tools equipped with vacuum capability to pick up debris and dust.

1.3.4 Fueling Areas

- Fueling areas should be covered.
- Fueling areas should be evaluated to ensure that pollutants (e.g., gasoline or oil) do not enter the MS4. Follow the procedures in section 4.2 of the SWPPP.

1.3.5 Material Management

- Store materials and waste in labeled containers under cover and in secondary containment.
- Chemicals should not be combined in containers.
- Hazardous waste must be labeled and stored according to hazardous waste regulations. Follow the procedures in section 4.4.4 of the SWPPP.
- Carefully transfer collected fluids from containers into designated storage areas as soon as possible.
- Store new and used batteries securely to avoid breakage. Store indoors or in secondary containment to contain potential acid leaks. Recycle used batteries.
- Conduct periodic inspections of storage areas to detect possible leaks.
- Do not wash or hose down storage areas unless there is prior approval to collect and discharge the water into the sanitary sewer. Use dry cleanup methods whenever possible.
- Keep lids on containers. Store them indoors or under cover to reduce exposure to rain.
- Inspect and maintain all pretreatment equipment, including interceptors, according to the manufacturer's maintenance schedule and at least once per year.
- Proper spill protocol should be followed to prevent chemicals from entering the stormwater system. Follow the procedures in section 4.1 of the SWPPP.

1.3.6 Parts Cleaning

- Use designated areas for engine, parts, or radiator cleaning. Do not wash or rinse parts outdoors. If parts cleaning equipment is not available, then capture parts cleaning fluids.
- Recycle cleaning solution. Never discharge waste to the sanitary sewer or storm sewer.
- Use steam cleaning or pressure washing of parts instead of solvent cleaning. Cleaning equipment must be connected to an oil/water interceptor prior entering the sanitary sewer.
- When using solvents for cleaning, drain parts over the solvent tank to avoid drips to the floor. Catch excess solutions and divert them back to tank. Allow parts to dry over the hot tank.

1.3.7 Vehicle and Equipment Washing

- Vehicle and equipment washing areas should be evaluated to ensure that pollutants (e.g., gasoline or oil, sediment, detergents) do not enter the MS4. Follow the procedures in section 4.3 of the SWPPP.

2.0 Infrastructure Operations and Maintenance

BSU has developed written O&M procedures to formalize the maintenance activities that are being undertaken to address stormwater infrastructure O&M requirements of the 2016 Massachusetts MS4 Permit. This Infrastructure O&M Plan includes procedures for:

- Inspecting and cleaning catch basins
- Sweeping streets and parking lots
- Snow and ice removal
- Inspecting constructed BMPs

Refer to the Appendix for the procedures relative to each of the referenced maintenance activities.

Although EH&S is the primary lead responsible for implementing the O&M Program, Facilities Management is largely responsible for inspection and maintenance of the stormwater infrastructure at BSU. A map of the existing stormwater infrastructure at BSU is provided in the Appendix.

Since most of the roadways, and therefore the catch basins and storm drain system located within these roadways, is owned by the City of Bridgewater, coordination is required with the City of Bridgewater to review responsibilities that overlap between the City of Bridgewater and BSU to confirm the MS4 Permit requirements are being met.

3.0 Stormwater Pollution Prevention Plan

BSU has prepared a written Stormwater Pollution Prevention Plan (SWPPP) to address the requirements of the MS4 Permit to develop and fully implement a SWPPP that covers the following facilities: maintenance garages, maintenance yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater as determined by BSU. The SWPPP is included in the Appendix.

This SWPPP accomplishes these requirements by:

- Providing an inventory of the materials and equipment at a facility that have the potential to cause stormwater pollution and identifying locations where these materials are stored.
- Describing how stormwater is managed at a facility, including: engineered storm drain system conveyance, on-site pretreatment, treatment and infiltration systems, and discharges to surface water directly from the site.
- Reviewing activities that occur at the facility that represent a potential for stormwater pollution.
- Describing the BMPs that will be implemented at the facility to reduce, eliminate, and prevent the discharge of pollutants to stormwater.
- Identifying the employees responsible for developing, implementing, maintaining, and revising, as necessary, this SWPPP.
- Establishing a schedule and description of site inspections to be conducted at the facility to determine if the SWPPP is effective in preventing the discharge of pollutants.
- Serving as a tool for the facility employees, including a place to maintain recordkeeping associated with these requirements.

The Spill Prevention Control and Countermeasure (SPCC) Plan dated November 2007 prepared by TRC Environmental Corporation that is currently in place for BSU is also included in the Appendix. The SPCC Plan describes oil and fuel storage on campus, as well as the spill prevention, control measures, and countermeasure procedures pertaining to oil storage.

4.0 Employee Training

Regular employee training is required for employees who work in areas where materials or activities are exposed to stormwater, or who are responsible for implementing activities identified in this O&M Program.

EH&S is responsible for stormwater management training for Facilities Management employees. This position coordinates training related to stormwater management on at least an annual basis to review specific responsibilities for implementing this O&M Program, what and how to accomplish those responsibilities, including SWPPP implementation.

Employees responsible for the fueling or lubrication of vehicles or equipment stored at the facility will be trained annually. The topics below will be covered at employee training sessions.

- Spill prevention and response
- Good housekeeping
- Materials management practices

Employees who perform maintenance or other applicable work at BSU buildings and facilities are trained annually on these procedures and the proper operation of related equipment.

Employees who handle pesticides, fertilizers, and herbicides are trained annually on proper handling and storage procedures.

Employees who perform snow and ice removal on campus are trained annually on these procedures and the proper operation of related equipment.

Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures annually.

If services are contracted, the contractor should be given a copy of this written O&M Program and any applicable referenced attachments to ensure compliance with MS4 regulations..

APPENDIX

Spill Prevention Control and Countermeasure (SPCC) Plan dated November 2007 prepared by TRC Environmental Corporation